IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Robert M. Foreman, et al.
Serial No.:	09/733,235
Filing Date:	December 8, 2000
Examiner:	Nghi H. Ly
Group Art Unit:	2686
Title:	SYSTEM AND METHOD FOR INTERFACING SATELLITE COMMUNICATIONS WITH AIRCRAFT

Mail Stop: Amendments
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certification Under 37 C.F.R. 1.8

Date of Mailing: June 29, 2004

I hereby certify that I have caused the documents indicated below to be deposited with the United States Postal Service with sufficient postage via first class mail under 37 CFR § 1.8 on the date indicated above and addressed to Mail Stop: Amendments, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Robert McLauchlan

AMENDMENT

Dear Sir:

In response to the Official Action mailed March 29, 2004, Applicants respectfully request the Examiner reconsider the rejections of the Claims in view of the following amendments to the Claims and comments as set forth below.

In the specification, the following paragraphs have been revised and are submitted herewith: page 7, the third paragraph beginning at line 9 and continuing through line 25; page 7, the fourth paragraph beginning on line 26 continuing through page 8, line 3; page 11, the third paragraph beginning at line 22 and continuing through page 12, line 13; page 12, the third paragraph beginning at line 20 and continuing through line 25; on page 12, the fourth paragraph beginning at line 26 and continuing through line 33.

Pages 1 and 10 of the figures have been revised as follows: on page 1, reference numeral "16" has been added; and on page 5, reference numeral 16 has been deleted and replaced with reference numeral "36". These figure pages have been redlined; replacement pages are submitted herewith.

FIGURE 1 is a diagram of one embodiment of the method for integrating commercial satellite communications technology with military technology of this invention. An Air Operations Command (AOC) 10 or a ground unit (GU) 12 can communicate with a commercial satellite network 14 via an off-board transceiver [[16]] 30 shown in FIGURE 2. AOC 10 and GU 12 communicate mission data, weather information, voice data, objective data and other data 19 to tactical aircraft 18. While only one off-board transceiver [[16]] 30 is shown for simplicity, it should be understood that there can be many off-board commercial transceivers [[16]] 30. Satellite network 14, as shown, may comprise a constellation of multiple satellites 20. Satellites 20 relay data 19 across satellite network 14 until data 19 reaches a satellite 20 that can communicate with destination aircraft 18. This allows data 19 to be communicated over large distances, well beyond line-of-sight. Aircraft 18 receives data 19 at an onboard commercial satellite transceiver [[22]] 30, via an antenna [[24]]. Data 19 is then communicated from commercial satellite transceiver [[22]] 30 to an onboard interface unit [[26]] 36. Because commercial satellite transceiver [[22]] can be a commercial off-the-shelf transceiver, there will be significant cost savings.

The onboard interface unit [[26]] 36 can process the data and communicate the appropriate data to a mission data processor 28, which may be a fire control computer [[30]], a multi-function display set 32, a display 34, a radio [[36]] 37 or intercom 38. Display 34 may be a commercial SVGA display, while the radio [[36]] 37 may be a UHF/VHF radio. Onboard interface unit [[26]] 36 can also send data 19 to onboard commercial satellite transceiver [[22]] 30 to be communicated back to AOC 10 or the GU 12, via commercial satellite network 14 and off-board commercial transceiver [[16]] 30. A pilot in aircraft 18 can send digital images, target data, voice data, search and rescue data or any other data 19 which may be required. Because the system uses two-way technology, AOC 10 can pull data from an individual aircraft 18. This provides a significant advantage over current broadcast satellite systems.

FIGUREs 5A-5C show a schematic and component view of onboard interface unit 36 of FIGURE [[1]] 4. As discussed in conjunction with FIGURE 4, the onboard interface unit 36 communicates with an onboard commercial transceiver [[22]] 30 and an onboard communications system 38. In one embodiment, the onboard interface unit 36 may comprise a commercial SATCOM control 60 which communicates control and status information with the onboard commercial transceiver 30. Commercial SATCOM Control 60 also communicates data with a computer processor 62. Computer processor 62 executes a software program 66 stored on a hard drive 68. Software program 66 may comprise image processing, video generation, voice recognition, speech synthesis programs and other software instructions 69. Computer processor 62 receives data 70 from onboard commercial satellite transceiver 30 and processes the data according to software instruction 66. If there is video data, computer processor 62 sends RS-170 video data via a video card 72 to a multi-function display set 32, or sends SVGA video data to a commercial display 34. Commercial display 34 can return information to computer processor 62 through an Ethernet/Serial Port 78. Two-way mission data can be communicated between computer processor 62 and mission data processor 28 via a Dual 1553 Bus 82. Two-way Voice data is communicated with the UHF/VHF radio [[36]] 37 via an improved data modem 86. Two-way analog voice data is communicated to the intercom 38 via sound card 90. Onboard ~~integration unit 16~~ interface unit 36 fully integrates onboard commercial transceiver 30 with the aircraft's existing onboard communications system. Onboard interface unit 16 may also include a GPS system 92. This GPS system 92 is capable of communicating navigational information to computer processor 62. Power converter 96 converts the aircraft's regular power to power for onboard interface unit [[16]] 36.

In order to preserve cost efficiencies, many components of onboard interface unit [[16]] 36 can be off-the-shelf components as known to those skilled in the art. For example, computer processor 62 can be an off-the-shelf Pentium or like system. Additionally, the video card 72, sound card 90, and improved data modem 86 can be off-the-shelf items. The use of an off-the-shelf Iridium transceiver for transceiver [[22]] 30 has also proved to be an effective solution.

FIGURE 6 shows one embodiment that mounts onboard commercial transceiver 30 and onboard interface unit [[16]] 36. The onboard commercial transceiver 30 is mounted below onboard interface unit [[16]] 36 in front of an aircraft cockpit 98. Because the units are mounted at the front of aircraft 18, they do not add to cockpit clutter. An antenna 32 can be added to the exterior of aircraft 18 without degrading performance. In order to prevent a loss of signals during maneuvering, multiple antennas may be used at several places on the aircraft's body.